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10/537,360	01/17/2006	Thomas Kley	4590-416	2655

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EXAMINER	
LEE, BENNY T	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/537,360	KLEY ET AL.	
	Examiner	Art Unit	
	Benny Lee	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,7-13,15,20-22 and 24-27* is/are rejected.

7)☒ Claim(s) *3,6,14,16-19,23 and 28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *26 June 2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11 May 2009 has been entered.

The substitute specification filed 11 May 2009 has been considered, found acceptable and has replaced the specification filed 5 January 2009.

The disclosure is objected to because of the following informalities in the substitute specification filed 11 May 2009: Page 16, line 4, note that for "gearbox unit 42", the reference to "Figure 10" does not appear appropriate as should reference just --Figures 8, 9-- for an appropriate characterization. Appropriate correction is required.

Claims 24, 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 24, 25, note that it remains unclear which ones of the recited (plural) dielectric bodies is intended by the recitation of "the dielectric (resonator) body". Clarification is needed.

The following claims have been found to be objectionable for reasons set forth below:

In all appropriate claims, note that in view of the plural number of features associated with the "filter", the examiner suggests that for the plural features recited in the dependent claims, such features should be defined as being --respective-- and --corresponding-- ones of the plural features for appropriate characterizations. Some, but not all, suggestions are as follow:

In claim 1, lines 5; claim 4, line 2: note that --respective-- should precede "cutout" for an appropriate characterization.

In claim 1, line 8; claim 2, line 3; claim 3, line 2; claim 5, lines 2, 3: note that --respective-- should precede "dielectric body", respectively for an appropriate characterization.

In claim 1 line 5; claim 2, line 4: note that --corresponding-- should be inserted prior to "ring-like" for an appropriate characterization.

In claim 1, line 8; claim 3, lines 3, 4; claim 5, lines 2, 3: note that --corresponding-- should precede "dielectric resonator element", respectively for an appropriate characterization.

In claim 3, line 2, note that --respective-- should precede "dielectric resonator element" for an appropriate characterization.

In claim 22, line 2, note that --of the filters-- should be inserted after "each" for clarity of description.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4, 7, 8, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa et al in view of Yamakawa et al (both of record).

Nishikawa et al discloses a radio frequency filter (e.g. Figs. 24-26) comprising: a filter body defining a plurality of dielectric resonant elements (e.g. dielectric cylindrical portions 106, 107, 108) spaced apart from each other to define in conjunction with upper and lower lids (102, 103) a plurality of filter cavities. However, the plurality of dielectric resonant elements do not include a ring like dielectric resonator element having a respective eccentric cutout in which a corresponding dielectric tuning element can be rotatably received therein to adjust the resonant frequency of the filter.

Nishikawa et al (e.g. Fig. 36) discloses a tuning mechanism for an exemplary dielectric resonant element (4), which includes two eccentric (i.e. offset from the center of the resonant element) cutouts or partial through holes located in the dielectric resonant element (4). A dielectric tuning body (e.g. dielectric rod 165) is insertable into and out of the cutouts to provide adjustment of the resonant frequency. The respective dielectric rods (165) are attached to a corresponding metallic portion (166) passing through a respective aperture (163) located in an upper case plate (162) as depicted generally in Fig. 33. As described in column 18, lines 35-46, the aperture (163) and corresponding metallic portion (166) define a threaded assembly, such that, in operation, the threaded metallic portion (166), can be rotated about a rotation axis to thereby provide a corresponding rotation and linear insertion along the rotation axis of dielectric rods (165) into and out of the cutouts in the dielectric resonant element (4) to thereby adjust the resonant frequency of the filter structure.

Yamakawa et al (e.g. Fig. 1(b) discloses a dielectric resonator filter comprising dielectric resonators having a ring-like configuration (i.e. 4, 5) and a dielectric resonator having a solid disk configuration. Note that as depicted with respect to Fig. 3(a) & Fig. 3(b), there are disclosed ring-like dielectric resonator having diameter (d) and solid disk dielectric resonators having a diameter (d=0), respectively. As described with respect to Figs. 6 & 7(a)-7(d), it is noted that the formation of an inner hole (i.e. in a disk shape dielectric resonator) causes the spurious frequencies to be dispersed depending on the increase in the diameter of the inner hole (e.g. see column 7, lines 1-21).

Accordingly, it would have been obvious in view of the references, taken as a whole, to have modified the plural resonant elements (106, 107, 108) in the Fig. 24 embodiment of Nishikawa et al to have included respective cutouts and corresponding dielectric tuning rods or bodies (such as those taught in Fig. 36 of Nishikawa et al). Such a modification would have been considered obvious since it would have imparted the advantageous benefit of the ability of tuning a dielectric filter, which previously was not tunable, thereby suggesting the obviousness of such a modification. Additionally, it would have been obvious in view of the teaching in Yamakawa et al to have further modified the solid disk shape dielectric resonator in Nishikawa et al to have included a centrally located inner hole as to have provided a ring-like dielectric resonator. Such a modification would have been considered obvious since it would have imparted to the dielectric resonator in Nishikawa et al the benefit of providing dispersal of spurious modes, provided by the presence of the inner hole (as taught by Yamakawa et al), as compared to a dielectric resonator, without an inner hole (i.e. a solid dielectric resonator), thereby suggesting the obviousness of such a modification. With respect to claim 2, note that as an obvious consequence

of the modification, the respective dielectric rods inserted within the corresponding cutout has an axis of rotation, which is parallel to the axis of the resultant ring-shape dielectric resonator. Moreover, with respect to claim 8, as known to those of ordinary skill in the art, by selecting the dielectric material of the dielectric resonant element and the dielectric tuning body to have been the same material, one of ordinary skill in the art would have provided optimal matching of thermal expansion characteristics (i.e. same material expand/contract at the same rate), thereby suggesting the obviousness of such a modification. Furthermore, with respect to claim 20, as known to those of ordinary skill in the art, the number of cavities can obviously be selected depending on the desired degree of frequency filtering (e.g. the more the cavities, the more refined is the frequency response), thereby suggesting the obviousness of such a modification.

With respect to claims 4, 5, note that FIG. 20 of Nishikawa et al further discloses the cylindrical dielectric resonator (i.e. 66) includes cylindrical through holes or apertures (i.e. 71), which can be inserted with dielectric material to provide for fine tuning of the resonant frequency. Accordingly, it would have been further obvious in view of the references, taken as a whole, to have provided the dielectric tuning rods (i.e. 165), as disclosed with Fig. 36 of Nishikawa et al, as the dielectric material inserted into tuning through holes (71) in Fig. 20 of Nishikawa et al. Such a modification would have been considered an obvious substitution of art recognized equivalent structures from the same field of endeavor (i.e. dielectric tuning elements inserted in the dielectric resonator body), thereby suggesting the obviousness of such a modification. Note that as an obvious consequence of the modification, the rotatable dielectric rods (i.e. 165) inserted into the through hole (71) must necessarily have an air gap to permit the rotation of and consequent insertion of the tuning element into the through hole (71).

Claims 9, 12, 13, 15, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above rejection as applied to claim 1 and further in view of Cavey (of record).

The filter of the above obviousness combination discloses the claimed invention except for a motor mounting plate and wall plates, which separate individual cavities.

Cavey (e.g. Fig. 4) discloses an exemplary tunable filter structure, which includes a plurality of dielectric resonator elements (e.g. dielectric puck 3) disposed within a housing having partition (i.e. walls) separating the dielectric resonator elements into individual cavities (e.g. 6). Moreover, note that the cavity housing includes an upper plate upon which a tuning assembly, including a stepping motor (13) which is provided to mechanically connected, via an opening in the upper plate of the housing, to a tuning element (e.g. a movable dielectric puck 2) disposed within a respective cavity adjacent a corresponding dielectric resonator element or puck (3) to thereby tune the resonant frequency of the respective cavities. Additionally, it should be noted that the stepping motors are controlled by or responsive to a controller, such as a computer (i.e. CPU) and a network analyzer, which can determine the tuning conditions and stores such tuning conditions in various memory devices (e.g. EEPROM 19) for subsequent use (e.g. the stored information may be in the form preset tuning information, such as in a table or the stored information may be dynamically controlled via a input through a keyboard (17) as described in column 6, lines 14, 15). Additionally, it should be noted that optical sensors (e.g. IR sensors) can be used by the CPU to digitally control the stepping motors to provide the desired degree of frequency tuning.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have further modified the filter of the above obviousness combination to have included walls

which partition the separate dielectric resonators into individual cavities and to have provided stepping motors for controlling the rotational and linear movement of the dielectric tuning rods (165) within the cutouts in the corresponding dielectric resonators, in view of the exemplary teaching thereof by Cavey. Such modifications would have been considered obvious since they would have imparted to the above obviousness combination the benefits of automatically control of tuning through the use of stepping motors, as well as providing a precise resonant frequency through the use of individual cavities, thereby suggesting the obviousness of such modifications.

Claims 21, 22, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above rejection as applied to claim 1, above and further in view of Wenzel et al (of record).

The filter of the above obviousness combination meets the claimed invention except for the filter cavities being arranged in a four square configuration and that the filter housing is formed by a sheet metal construction.

Wenzel et al (e.g. Fig. 1) exemplarily discloses a filter configuration having four cavities (e.g. 28) configured in a square shape configuration. Furthermore, Fig. 17 discloses a housing formed by a sheet metal construction, where the walls of the housing are assembled and secured to each other.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have further modified the above obviousness combination to have configured the cavities in a four cavity square configuration, such as taught by Wenzel et al. Such a modification would have been considered an obvious substitution of art recognized equivalent cavity filter configurations known to those of ordinary skill in the art and whose configuration is dependent on desired filtering characteristics, thereby suggesting the obviousness of such a modification. Moreover,

the use of sheet metal to form a cavity filter housing would have been considered an obvious design consideration providing the benefit of light weight construction, as known to those of ordinary skill in the art, thereby suggesting the obviousness of such a modification.

Claims 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above rejection as applied to claim 9 above, and further in view of Wenzel et al (of record).

The filter of the above combination discloses the claimed invention except for the filter being formed by conductive plates being plugged into one another.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have modified the filter of the above combination to have been formed by a sheet metal construction in which the filter housing is assembled by plugging together the conductive plates, such as exemplarily taught by Fig. 17 of Wenzel et al. Such a modification would have been considered obvious since it would have provided the benefit of constructing the housing in a simple manner (i.e. plugging plates into one another), thereby suggesting the obviousness of such a modification. It is noted that as an obvious consequence of forming the cavities using the sheet metal construction, such construction provides for opening between the cavities for coupling purposes, such as exemplarily taught by Fig. 17 of Wenzel et al, thereby suggesting the obviousness of such a modification.

Applicant's arguments filed 11 May 2009 have been fully considered but they are not persuasive.

Regarding the Nishikawa et al reference, applicants' contend that Fig. 36 of Nishikawa et al does not disclose that the "position" of the dielectric tuning rods relative to the dielectric resonator element provides for tuning of the frequency of the filter. Rather, applicants' assert that

the rotation of the dielectric rods (165) is merely incidental and that it is the "axial displacement" of the dielectric tuning rod, which achieves the desired frequency tuning. Applicants' further emphasize that the rotation of the dielectric rods (165) would not have been considered important since it would not have affected the tuning regards applicants' invention, since it is the axial displacement, which is critical in Nishikawa et al.

In response, contrary to applicants' assertion, the examiner considers that the "position" of the dielectric tuning rod (i.e. 165) is indeed "varied" with respect to the dielectric body tune the frequency of the filter. That is to say, the "position" of the dielectric tuning rod being "varied" can be broadly construed by the "axial displacement" of the dielectric tuning rod within the cutout of the dielectric body (i.e. by varying the "axial displacement" of the dielectric tuning rod into/out of the cutout, the "position" of such a dielectric rod is varied). As for the rotation of the dielectric rod, such rotation is more than just incidental, since the degree of rotation directly affects the "position" of the dielectric tuning rod within the dielectric body (i.e. by rotating the dielectric rod, the amount of axial displacement can be made deeper or shallower within the cutout).

With regard to the Yamakawa et al reference, applicants' contend that the examiner has failed to take into consideration the "discs 15-20", when forming the inner hole of the dielectric disc to create the ring-like resonator. Applicants' further emphasize this by contending that the hypothetical person of ordinary skill in the art would not have been led to make the combination as proposed by the examiner, to remedy the purported problem of attenuating spurious frequencies, especially when such problems are not recognized by Nishikawa et al, while

ignoring the need of the discs (15-20), when forming such a spurious frequency attenuating inner hole, as required by Yamakawa et al.

In response, the examiner acknowledges that while Nishikawa et al it self does not necessarily recognize the spurious frequency problems in solid disc dielectric resonators, such a problem is nonetheless recognized by Yamakawa et al as being common to solid disc resonators (e.g. such as the type generally taught in Nishikawa et al). Accordingly, Yamakawa et al proposes a specific solution to this problem (i.e. forming an inner opening, thereby creating a ring-like dielectric resonator), which is recognized as common to solid disc shape dielectric resonators (irrespective of whether Nishikawa et al recognizes it or not). Therefore, a hypothetical person of ordinary skill in the art would have indeed been led to apply this solution to a recognized problem for solid disc dielectric resonators (i.e. spurious frequencies) by forming the inner hole, as taught by Yamakawa et al, in solid disc dielectric resonators (i.e. such as the type generally taught in Nishikawa et al) to remedy this common problem. As for the necessary presence of the tuning elements (i.e. 15-20 in Yamakawa et al), it must be noted that tuning elements (i.e. the dielectric tuning rods 165) are nonetheless present for the dielectric resonators in the proposed combination resulting in the formation of spurious frequency reducing ring-like dielectric resonator, which would have corresponded to tuning elements (15-20 in Yamakawa et al).

Applicants' further contend that neither Nishikawa et al or Yamakawa et al disclose a ring-like resonator having an offset "round" cutout. In particular, it is emphasized that while Yamakawa et al of Nishikawa et al (e.g. Figs. 38, 39) do show the ring-like resonator, such resonators respectively lack any corresponding cutout. Applicants' has attempted to more clearly

define the nature of the "cutout" by emphasizing the description in the specification (e.g. page 4 of the specification) and further argues that neither Nishikawa et al or Yamakawa et al discloses such a "cutout".

In response, the examiner must point out that the claims do not actually recite that the "cutout" is "round". In fact, the claims merely recite that that the "cutout" is "eccentric" and "offset" from the axis of the ring-like resonator. Accordingly, the argument of a "round cutout" is not commensurate with what is actually claimed. Moreover, it must be noted that the cutouts that result from the obviousness combination are indeed "eccentric" and "offset" (i.e. the cutouts, as taught by Nishikawa et al, are at the periphery of the dielectric resonator, thereby meeting the "eccentric" and "offset" nature of such "cutouts" in view of the teaching and suggestion of Fig. 36). Furthermore, while applicants' can rely on the specification to provide support for claimed subject matter (i.e. define the "cutout"), the examiner will not necessarily read such specific limitations of the "cutout" into the broad recitation of the "cutout" in the claims. Therefore, the examiner has provided a reasonable interpretation and reading of what can broadly characterize a "cutout", which is "eccentric" and "offset" by the proposed obviousness combination.

With regard to the disclosures of Cavey and Wenzel et al, applicants' contend that such references do not provide any teaching to the hypothetical skilled person to overcome the deficiencies in the proposed combination.

In response, the examiner must note that the further combinations based on Cavey and Wenzel et al were not intended to make up for any purported shortcomings in the primary combination, but were relied on to provide additional obviousness teachings. In fact, since the primary obviousness combination of Nishikawa et al and Yamakawa et al do indeed meet the

claimed limitations, there certainly would not have been any need to even look towards Cavey and Wenzel et al to make up for any purported shortcomings in the proposed primary combination.

It should be noted that from applicants' disclosure, as well from the arguments presented by applicants', that a potentially distinguishing characteristic of applicants' invention is that it is the (angular) --orientation-- of the tuning body, which can be varied while set at a fixed position within the cutout. This would appear to distinguish over the interpretation, where the broadly recited "position" being varied, can be construed as the amount of "axial displacement" within the cutout, as advance by the proposed obviousness combination.

Claims 3, 6, 14, 16-19, 23, 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication should be directed to Benny Lee at telephone number 571 272 1764.

/BENNY LEE/
PRIMARY EXAMINER
ART UNIT 2817

B. Lee